IN THE CLAIMS

Please amend the claims as follows:

1. (currently amended) A microfluidic device for reducing sample dispersion and cross-contamination, comprising:

a microchannel system disposed on a substrate, the microchannel system comprising at least two microchannels joined together to form a junction at their intersection, wherein at least one of the microchannels has a reduced effective cross-sectional area proximate the junction that is less than the cross-sectional area of the junction, and wherein the reduced effective cross-sectional area extends from the junction into the microchannel a distance of from about 0.5 to 4 microchannel widths.

2. (canceled)

3. (original) The device of claim 1, wherein the reduced effective cross-sectional area comprises a porous material disposed in the microchannel.

4. (original) The device of claim 1, wherein the reduced effective cross-sectional area comprises structures disposed in the microchannel.

5-18 (canceled)

19. (currently amended) A device for eliminating sample dispersion at microchannel junctions, comprising:

a first and a second branching junction, wherein each branching junction has one inlet channel and two outlet channels and wherein the inlet channels of said first and second branching junctions are joined together to form a junction and wherein each of the outlet channels is provided with a region of reduced effective cross-sectional area proximate the junction, and wherein the region of reduced effective cross-sectional area extends from the junction into the microchannel a distance of from about 0.5 to 4 microchannel widths.

20. (canceled)

21. (original) The device of claim 19, wherein the reduced effective cross-sectional area comprises a porous material disposed in the microchannel.

22. (original) The device of claim 19, wherein the reduced effective cross-

sectional area comprises structures disposed in the microchannel.

23. (currently amended) The device of claim 19, wherein the reduced effective cross-sectional area is about 10% that of the cross-sectional area of the microchannel.[[.]]

24-27 (canceled)

28. (currently amended) A method for controlling sample dispersion and cross contamination of microchannels, comprising:

providing a microchannel system, the microchannel system comprising;

a substrate having at least two microchannels disposed thereon, wherein the microchannels intersect to form at least one junction; and

modifying at least one microchannel to produce at least one region of reduced effective cross-sectional area proximate the junction, wherein the region of reduced effective cross-sectional area extends from the junction into the microchannel a distance of from about 0.5 to 4 microchannel widths.

29. (original) The method of claim 28, wherein said step of modifying includes reducing the geometric cross-sectional area, filling the microchannel with a porous material, or packing the microchannel with structured particles.

30. (currently amended) A method for reducing mass transport by diffusion, comprising:

providing at least two spaced apart regions of reduced effective cross-sectional area within a microchannel, wherein the regions of reduced cross-sectional area are about 0.5 to 4 microchannel widths long.

31. (canceled)

32. (new claim) The device of claim 1, wherein the microchannels are disposed in an orthogonal relationship.

33. (new claim) The device of either of claims 1 or 19, herein at least one of the regions of reduced effective cross-sectional area is about 0.5 to 4 microchannel widths long.